THREE-DIMENSIONAL MULTI-FOLDABLE DEVICE

CROSS-REFERENCE TO RELATED APPLICATION

This application claims priority under 35 U.S.C. §119 to Korean Patent Application No. 10-2008-0097407, filed on Oct. 2, 2008, in the Korean Intellectual Property Office (KIPO), the entire contents of which are herein incorporated by reference.

BACKGROUND

1. Field

Example embodiments relate to a portable device, and more particularly, to a three-dimensional (3D) multi-foldable device transformable into various forms by rotating wing panels by 180° about parallel rotation axes.

2. Description of the Related Art

Devices, for example, portable radios and portable CD players, have been used for a long time due to their convenient portability, and one or more portable devices as portable mobile communication terminals are popular due to the development of the mobile communication industry.

Portable devices are becoming smaller, slimmer, and lighter in consideration of the portability. These portable devices may be representatively divided into a folder type portable device, in which a cover rotates about a rotation axis so as to open or shut with respect to a body, and a slider type portable device, in which a cover slides along a body so as to open or shut the portable device.

However, as the portable devices are becoming multifunctional, for example, as in camera phones, game phones, and digital multimedia broadcasting (DMB) phones capable of implementing various functions in a single device, typical folder-type or slider-type portable devices cannot satisfy the current demands for functional transformation due to their physical restrictions.

For example, folder-type or slider-type devices may include functional keys on one surface of a body and a display panel on one surface of a cover, and thus are not inconvenient as mobile phones or MPEG audio layer-3 (MP3) players. However, as DMB players or cameras, the folder-type or slider-type devices may not satisfy the users' demands for larger display panels. If larger display panels are used in order to satisfy the users' demands, the overall sizes of the folder-type or slider-type devices increases, thereby reducing their portability and holdability.

Also, as interests in health increase, portable medical devices for checking blood pressure, body temperature, pulse rate, and/or blood glucose level, are being used. The portable medical devices need to be combined with portable mobile communication devices in order to implement ubiquitous health care (U-healthcare) systems for remotely receiving medical services by transmitting results determined with the portable medical devices.

However, due to insufficient use of space, a portable medical device for checking a patients needs, for example, blood pressure, and/or blood glucose level, may not be realized as a typical folder-type or slider-type portable device.

SUMMARY

Example embodiments include a three-dimensional (3D) multi-foldable device having various designs according to functions desired by a user. Example embodiments include a 3D multi-foldable device transformable into various forms by simply rotating wing panels by 180° about two parallel rotation axes. Example embodiments include a 3D multi-foldable device in which various portable devices may be implementable as a single device.

Example embodiments include a 3D multi-foldable device capable of firmly maintaining its changed form by using a magnetic force. Example embodiments include a 3D multi-foldable device connectable to one or more other 3D multi-foldable devices by using a magnetic force. Example embodiments include a 3D multi-foldable device having high space usability in a small and slim size.

Additional aspects will be set forth in part in the description which follows and, in part, will be apparent from the description, or may be learned by practice of example embodiments.

In accordance with example embodiments, a three-dimensional (3D) multi-foldable device may include a first unit having a first center panel and a pair of first wing panels. The pair of first wing panels may be rotatable by 180° about two parallel edges of the first center panel. The two parallel edges of the first center panel may act as rotation axes for the pair of first wing panels. The example three-dimensional (3D) multi-foldable device may also include a second unit having a second center panel and a pair of second wing panels. The pair of second wing panels may be rotatable by 180° about two parallel edges of the second center panel. The two parallel edges of the second center panel may act as rotation axes for the pair of second wing panels. In example embodiments the rotation axes of the second unit may be identical to the rotation axes of the first unit. The example three-dimensional (3D) multi-foldable device may also include a third unit having a third center panel and a pair of third wing panels. The pair of third wing panels may be rotatable by 180° about two parallel edges of the third center panel. The two parallel edges of the third center panel may act as rotation axes for the pair of third wing panels. The example three-dimensional (3D) multi-foldable device may also include a fourth unit having a fourth center panel and a pair of fourth wing panels. The pair of fourth wing panels may be rotatable by 180° about two parallel edges of the fourth center panel. The two parallel edges of the fourth center panel may act as rotation axes for the pair of fourth wing panels. In example embodiments the rotation axes of the fourth unit may be identical to the rotation axes of the third unit. In accordance with example embodiments, the rotation axes of the first and second units may be perpendicular to the rotation axes of the third and fourth units, and at least some portions of the pair of the third wing panels may be combined with the first and second wing panels at one side of the pairs of the first and second wing panels, and at least some portions of the pair of the fourth wing panels may be combined with the first and second wing panels at the other side of the pairs of the first and second wing panels.

In accordance with example embodiments, a three-dimensional (3D) multi-foldable device may include at least four units, each of the at least four units may include a center panel with two parallel edges and a pair of wing panels. The wing panels may be rotatable by 180 degrees about the two parallel edges of their respective center panels. The parallel edges may act as rotation axes for their respective pairs of wing panels. In accordance with example embodiments, the rotation axes of the first and second units may be perpendicular to the rotation axes of the third and fourth units, and at least some portions of the pair of third wing panels may be combined with the first and second wing panels at one side of the pairs of the first and second wing panels. In accordance with example embodiments, at least some portions of the pair of